

1.1 What is Earth Science?

I. The Scientific study of Earth

A. The scientific study of Earth began w/ observations

1. For many centuries, scientific discoveries were limited to observations made with the eye (physical)

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B. Earth Science developed from these early observations of phenomena

* C. Earth Science - the of Earth and the Universe around it

1. Earth Science assumes that the causes of natural events or phenomena (i.e. volcanoes) are discovered through careful observation and experimentation

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II. Branches of Earth Science

A. Geology - the study of the origin, history, processes, and structure of the solid Earth

B. Oceanography - the study of Earth's Oceans

1. nearly 71% of the Earth's surface is covered by Ocean

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C. Meteorology - the study of the Earth's atmosphere

1. Meteorologists also study weather + climate, the patterns of weather that occur over long periods of time

D. Astronomy - the study of the Universe and beyond

- telescopes, satellites, and space probes have greatly influenced how we study Astronomy

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E. Environmental Science - the study of how humans interact with their environment

III. The Importance of Earth Science

A. Natural forces not only shape Earth but also affect life on Earth

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Section 1.1 Review

Grade: 9th

Subject: Earth Science

Date:

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1 Meteorology is the study of the earth's atmosphere

True
False

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2 Meteorologists also study weather and _____

A geography
B climate
C space

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3 Oceans cover what percentage of Earth's surface?

A 75%
B 82%
C 54%

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4 Monitoring temperature change over a month is a good way to measure climate change

True
False

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I.2 Science as a process

I. Behavior of Natural Systems

A. Scientists expect nature to be predictable and understandable

1. This means that future natural events/forces can be better understood

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II Scientific Methods- guidelines to scientific problem solving

A. Observation - process of using the senses to gather information about the world

B. Hypothesis -

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- 1. Hypotheses often times seek to answer a question raised by our observations
- C. Testing the Hypothesis
 - 1. Hypotheses are generally tested w/ an experiment

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- 2. an experiment is a procedure that is carried out according to certain guidelines
 - a. factors that can be changed in an experiment are variables
 - b. Independent variable- factors that can be changed by the person performing the experiment
 - c. Dependent variable- variables that change as a result of changing the independent variable

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- d. A control group serves as a standard of comparison w/ another group to which the control group is identical except one factor
 - otherwise known as a control
- D. Draw conclusions- it is critical to analyze the results of an experiment in order to draw conclusions about the tested hypothesis

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- 1 Which variable does a scientist manipulate during an experiment?
 - A dependent
 - B independent
 - C interdependent

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- 2 Scientists manipulate the control group of an experiment when performing research

True
False

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- III. Scientific Measurements and Analysis
 - A. Measurements are an important method for gathering information
 - B. Accuracy and Precision
 - 1. Accuracy- refers to how close a measurement is to the true value of the thing being measured
 - 2. Precision- the exactness of the measurement

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a. example: inches are more precise than feet

C. Error - the amount of imprecision or variation in a set of measurements

1. Error is commonly expressed as a percentage error or confidence interval

→ percent error = $\frac{\text{Accepted value} - \text{experimental value}}{\text{accepted value}} \times 100$

pg. B = $\frac{(3.78 - 3.72)}{3.78} \times 100$

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D. Observations and Models

1. Models - a description, representation, or imitation of an object, system, process, or concept

IV Acceptance of Scientific Ideas

A. When scientists reach a conclusion, they introduce their findings to the Scientific community

B. Publication of Results + Conclusions

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1. Scientists present their findings in scientific journals and professional meetings

C. ^{*}Peer review - the process in which several experts on a given topic review another expert's work before it can be published

D. Formulating a Theory

1. When an idea has undergone much testing and reaches general acceptance, that idea may help form a theory

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2. A Theory is an explanation that is consistent with all existing tests and observations

a. often based on scientific laws

3. A scientific law - a general statement that describes how the natural world behaves under certain conditions and for which no exceptions have been found

★ Class webpage: www.geraldinescience.wikispaces.com

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E. Importance of Interdisciplinary Science

1. The exchange of ideas between fields of science allows scientists to identify explanations that fit a wide range of scientific evidence

V Science + Society

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A. Scientific knowledge helps us understand our world

B. Science is also used to develop technology

1. However, technology can create new problems

★ Class discussion

How, why?

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Section 1.2 review

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1 Error is the amount of imprecision or variation in a set of measurements

True
False

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2 Accuracy refers to how exact your measurement is or how consistent your measurements are

True
False

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3 A theory is an explanation that is consistent with all existing tests and observations

True
False

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4 A scientific law does not have much data or scientific evidence to confirm its truthfulness

True
False

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5 Scientific knowledge helps us understand our world

True
False

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